Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL QUALITY MEASURES CLEARINGHOUSE

# General

## Title

Intra-procedure colonoscopy complication rate: percentage of patients who developed one or more intra-procedure colonoscopy complications.

## Source(s)

AAAHC Institute for Quality Improvement. 2017 January-June colonoscopy study: procedure specific survey. Skokie (IL): AAAHC Institute for Quality Improvement; 2017. 2 p.

# Measure Domain

## Primary Measure Domain

Clinical Quality Measures: Outcome

## Secondary Measure Domain

Does not apply to this measure

# Brief Abstract

## Description

This measure assesses the percentage of patients who developed one or more intra-procedure colonoscopy complications.

## Rationale

Colonoscopy is the most sensitive method to detect colorectal neoplasia and prevent deaths from colon cancer, which is the second leading cause of death due to cancer in the United States. Colorectal cancer (CRC) screening, no matter what method is used, is cost effective (Hawk & Levin, 2005; Omidvari, Meester, & Lansdorp-Vogelaar, 2016). The Centers for Disease Control and Prevention (CDC) (2011) estimates that from 2003 to 2007, increased screening has decreased CRC incidence and mortality in the United States by almost half. Further, although there will continue to be disagreement about what the "best" test is for detecting colorectal cancer, colonoscopy allows the endoscopist to remove lesions and polyps at the time of the procedure (unlike a barium enema or computed tomography [CT] colonography),

and may detect cancer in a substantial proportion (45%) of people whose colon cancer is in the proximal colon, which would otherwise go undetected (as opposed to sigmoidoscopy) and lead to death (Rosman & Korsten, 2007; Imperiale et al., 2012; Rozen, Liphshitz, & Barchana, 2012). Additionally, the sensitivity of colonography has been found to be lower than that of colonoscopy overall, and especially poor for polyps less than 5 to 6 millimeters in size (Atkin et al., 2013; Cash et al., 2012; Simons et al., 2013). Colonography does not usually include sedation, use of air to inflate the colon may cause discomfort, and it is not as cost-effective—a follow-up colonoscopy may be required.

Colonoscopy is not without cost. Payers may cover direct costs. Bowel preparation, patient selection and anesthesia level (Shingina et al., 2016), and polypectomy (Saraste et al., 2016) can influence outcomes. Risks to patients include, but are not limited to, bowel perforation/bleeding (Reumkens et al., 2016; Nabi, 2016). And there is potential patient discomfort (Kim et al., 2012) (although it should be noted that bowel preparation, a significant source of patient discomfort for colonography and colonoscopy, is identical for both procedures). Additionally, rate of poor bowel prep may decrease the cost-effectiveness of colonoscopy (Kingsley et al., 2016). These factors must be considered in a cost-benefit analysis. Many national organizations have clinical practice guidelines that recommend colorectal cancer screening for select populations, and several refer to colonoscopy as the preferred screening process in certain patient populations (National Guideline Clearinghouse, 2017).

In 2006, of the almost 6.25 million colonoscopy procedures performed in the ambulatory setting, approximately 60% (almost 3.7 million) were performed in freestanding facilities (CDC, 2006).

Perforation of the large intestine is one of colonoscopy's most serious potential complications. The American Society for Gastrointestinal Endoscopy (ASGE) and the American College of Gastroenterology (ACG) recommend using incidence of perforation as one measure of colonoscopy quality (Rex et al., 2015).

## Evidence for Rationale


AAAHC Institute for Quality Improvement. Colonoscopy January-June 2016 report: performance measurement and benchmarking in ambulatory care organizations. Skokie (IL): AAAHC Institute for Quality Improvement; 2016. 29 p. [20 references]

Atkin W, Dadswell E, Wooldrage K, Kralj-Hans I, von Wagner C, Edwards R, Yao G, Kay C, Burling D, Faiz O, Teare J, Lilford RJ, Morton D, Wardle J, Halligan S, SIGGAR investigators. Computed tomographic colonography versus colonoscopy for investigation of patients with symptoms suggestive of colorectal cancer (SIGGAR): a multicentre randomised trial. Lancet. 2013 Apr 6;381(9873):1194-202. PubMed

Cash BD, Riddle MS, Bhattacharya I, Barlow D, Jensen D, del Pino NM, Pickhardt PJ. CT colonography of a Medicare-aged population: outcomes observed in an analysis of more than 1400 patients. AJR Am J Roentgenol. 2012 Jul;199(1):W27-34. PubMed

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Hawk ET, Levin B. Colorectal cancer prevention. J Clin Oncol. 2005 Jan 10;23(2):378-91. [167 references] PubMed

Imperiale TF, Glowinski EA, Lin-Cooper C, Ransohoff DF. Tailoring colorectal cancer screening by considering risk of advanced proximal neoplasia. Am J Med. 2012 Dec;125(12):1181-7. PubMed

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Omidvari AH, Meester RG, Lansdorp-Vogelaar I. Cost effectiveness of surveillance for GI cancer. Best Pract Res Clin Gastroenterol. 2016 Dec;30(6):879-91. PubMed

Reumkens A, Rondagh EJ, Bakker CM, Winkens B, Masclee AA, Sanduleanu S. Post-colonoscopy complications: a systematic review, time trends, and meta-analysis of population-based studies. Am J Gastroenterol. 2016 Aug;111(8):1092-101. PubMed

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Rosman AS, Korsten MA. Meta-analysis comparing CT colonography, air contrast barium enema, and colonoscopy. Am J Med. 2007 Mar;120(3):203-10.e4. [74 references] PubMed

Rozen P, Liphshitz I, Barchana M. Changing epidemiology of colorectal cancer makes screening sigmoidoscopy less useful for identifying carriers of colorectal neoplasms. Dig Dis Sci. 2012 Aug;57(8):2203-12. PubMed

Saraste D, Martling A, Nilsson PJ, Blom J, TÃ¶rnberg S, Hultcrantz R, Janson M. Complications after colonoscopy and surgery in a population-based colorectal cancer screening programme. J Med Screen. 2016 Sep;23(3):135-40. PubMed

Shingina A, Ou G, Takach O, Svarta S, Kwok R, Tong J, Donaldson K, Lam E, Enns R. Identification of factors associated with sedation tolerance in 5000 patients undergoing outpatient colonoscopy: Canadian tertiary center experience. World J Gastrointest Endosc. 2016 Dec 16;8(20):770-6. PubMed

Simons PC, Van Steenbergen LN, De Witte MT, Janssen-Heijnen ML. Miss rate of colorectal cancer at CT colonography in average-risk symptomatic patients. Eur Radiol. 2013 Apr;23(4):908-13. PubMed

## Primary Health Components

Colorectal cancer; colonoscopy; intra-procedure complications; arrhythmia; bleeding requiring treatment; excessive pain; extended recovery; hospital transfer; hypotension; hypoxia; nausea; vomiting; noted perforation

## Denominator Description

Patients undergoing colonoscopy procedure at the ambulatory health care organization (see the related "Denominator Inclusions/Exclusions" field)

## Numerator Description

Number of patients from the denominator who developed one or more intra-procedure complications (see the related "Numerator Inclusions/Exclusions" field)

# Evidence Supporting the Measure

## Type of Evidence Supporting the Criterion of Quality for the Measure

A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence

A systematic review of the clinical research literature (e.g., Cochrane Review)

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

## Additional Information Supporting Need for the Measure

- Colonoscopy is generally recommended for those over 50 up to 75 years of age, and 76 to 85 years of age depending on the patient's overall health and prior screening history (U.S. Preventive Services Task Force, 2016).
- Colorectal cancer is the second leading cause of cancer death. A five year localized (Stage I) survival rate is 90.1%; the overall five year survival rate drops to 13.5% for metastasized cancer (Stage IV) (National Cancer Institute [NCI], n.d.).
- Colorectal cancer screening is effective in reducing mortality from colorectal cancer. Relative cost-effectiveness of all major strategies have favorable cost-effectiveness ratios compared with no screening. Modeling indicates that colonoscopy can be more cost effective than other options, depending upon adherence with guidelines regarding the various types of testing and the ability of colonoscopy to provide 50% protection against colorectal cancer in the proximal colon (Sharaf & Ladabaum, 2013; Zauber, 2010).
- Established indications for colonoscopy include: abnormal imaging study findings; excision of a colonic polyp; family history: hereditary nonpolyposis colorectal cancer and/or sporadic colorectal cancer at less than 60 years of age; identification or treatment of bleeding lesions; unexplained diarrhea; unexplained iron deficiency anemia; unexplained gastrointestinal (GI) bleeding (hematochezia, non-upper GI source melena, fecal occult blood); patient history of neoplastic polyp/treatable cancer, ulcerative colitis, Crohn's disease, or left-side colitis; preventive screening: asymptomatic patient, average risk of colon cancer; and surveillance for inflammatory bowel disease (IBD)/extent of IBD (Lieberman et al., 2012).

Note: Refer to the *Colonoscopy January-June 2016 Report*, the AAAHC Institute's latest in a series of studies (since 2001) of this procedure performed in the ambulatory setting. The reports provide examples of ideas for quality improvement and benchmarking, as well as reporting.

## Evidence for Additional Information Supporting Need for the Measure

AAAHC Institute for Quality Improvement. Colonoscopy January-June 2016 report: performance measurement and benchmarking in ambulatory care organizations. Skokie (IL): AAAHC Institute for Quality Improvement; 2016. 29 p. [20 references]

Lieberman DA, Rex DK, Winawer SJ, Giardiello FM, Johnson DA, Levin TR. Guidelines for colonoscopy surveillance after screening and polypectomy: a consensus update by the US Multi-Society Task Force on Colorectal Cancer. Gastroenterology. 2012 Sep;143(3):844-57. [85 references] PubMed

National Cancer Institute (NCI). Cancer stat facts: colon and rectum cancer. [internet]. Bethesda (MD): National Cancer Institute (NCI);

Sharaf RN, Ladabaum U. Comparative effectiveness and cost-effectiveness of screening colonoscopy vs. sigmoidoscopy and alternative strategies. Am J Gastroenterol. 2013 Jan;108(1):120-32. PubMed

U.S. Preventive Services Task Force. Screening for colorectal cancer: U.S. Preventive Services Task Force recommendation statement. JAMA. 2016 Jun 21;315(23):2564-75. [32 references] PubMed

Zauber AG. Cost-effectiveness of colonoscopy. Gastrointest Endosc Clin N Am. 2010 Oct;20(4):751-70. PubMed

## Extent of Measure Testing

Limited reliability and validity testing have been completed.

Reliability testing has included comparing information in the surveys to patients' charts and surgical logs - different sources of much the same data.

Validity testing has included examining face validity, content validity, and external validity (generalizability), with survey developers and participating organizations from year-to-year.

Unfortunately, there is little in the way of established measures to test criterion validity.

## Evidence for Extent of Measure Testing

AAAHC Institute for Quality Improvement. Colonoscopy January-June 2016 report: performance measurement and benchmarking in ambulatory care organizations. Skokie (IL): AAAHC Institute for Quality Improvement; 2016. 29 p. [20 references]

# State of Use of the Measure

## State of Use

Current routine use

## Current Use

not defined yet

# Application of the Measure in its Current Use

## Measurement Setting

Ambulatory/Office-based Care

Ambulatory Procedure/Imaging Center

### Professionals Involved in Delivery of Health Services

not defined yet

### Least Aggregated Level of Services Delivery Addressed

Single Health Care Delivery or Public Health Organizations

### Statement of Acceptable Minimum Sample Size

Unspecified

### Target Population Age

Unspecified

### Target Population Gender

Either male or female

## National Strategy for Quality Improvement in Health Care

### National Quality Strategy Aim

Better Care

### National Quality Strategy Priority

Health and Well-being of Communities
Making Care Safer

## Institute of Medicine (IOM) National Health Care Quality Report Categories

### IOM Care Need

Living with Illness

Staying Healthy

### IOM Domain

Safety

# Data Collection for the Measure

## Case Finding Period

Procedure specific data are collected in a prospective manner for approximately 6 months.

## Denominator Sampling Frame

Patients associated with provider

## Denominator (Index) Event or Characteristic

Diagnostic Evaluation

## Denominator Time Window

not defined yet

## Denominator Inclusions/Exclusions

Inclusions
Patients undergoing colonoscopy procedure at the ambulatory health care organization

Note: Refer to the original measure documentation for specific Current Procedural Terminology (CPT) codes.

Exclusions
Unspecified

## Exclusions/Exceptions

not defined yet

## Numerator Inclusions/Exclusions

Inclusions
Number of patients from the denominator who developed one or more intra-procedure complications*

*Complications include arrhythmia, bleeding requiring treatment, excessive pain, extended recovery, hospital transfer, hypotension (requiring intervention), hypoxia (requiring intervention), nausea and/or vomiting, noted perforation, and "other" (specified).

Exclusions
Unspecified

## Numerator Search Strategy

Fixed time period or point in time

## Data Source

Administrative clinical data

Health professional survey

### Type of Health State

Adverse Health State

### Instruments Used and/or Associated with the Measure

2017 January-June Colonoscopy Study: Procedure Specific Survey

## Computation of the Measure

### Measure Specifies Disaggregation

Does not apply to this measure

### Scoring

Rate/Proportion

### Interpretation of Score

Desired value is a lower score

### Allowance for Patient or Population Factors

not defined yet

### Standard of Comparison

not defined yet

## Identifying Information

### Original Title

Intra-procedure complication rate.

### Measure Collection Name

AAAHC Institute for Quality Improvement Performance Measurement Initiative

### Submitter

AAAHC Institute for Quality Improvement, Performance Measurement Initiative, Colonoscopy Work Group - Health Care Accreditation Organization

## Developer

AAAHC Institute for Quality Improvement, Performance Measurement Initiative, Colonoscopy Work Group - Health Care Accreditation Organization

## Funding Source(s)

Accreditation Association for Ambulatory Health Care (AAAHC)

## Composition of the Group that Developed the Measure

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- Dianna Burns, CGRN, Member, PMI Colonoscopy Work Group
- Bruce Cameron, MD, Member, PMI Colonoscopy Work Group
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- W. Elwyn Lyles, MD, FACG, Member, PMI Colonoscopy Work Group
- Thomas Murray, Member, PMI Colonoscopy Work Group
- Christopher Vesy, MD, Member, PMI Colonoscopy Work Group
- Naomi Kuznets, PhD, Vice President & Senior Director, AAAHC Institute for Quality Improvement

## Financial Disclosures/Other Potential Conflicts of Interest

Drs. Bentley, Cameron, Kim, Lyles, and Vesy, and Ms. Burns and Mr. Chapman are members of the Accreditation Association for Ambulatory Health Care (AAAHC) Institute or AAAHC Boards and as such must complete conflict of interest forms.

Mr. Murray is on staff at the American Gastroenterological Association.

Dr. Kuznets is on staff at the AAAHC Institute, and as such, must complete forms disclosing any conflicts of interest.

There have been no conflicts of interest stated on any of the conflicts of interest forms aforementioned.

## Adaptation

This measure was not adapted from another source.

## Date of Most Current Version in NQMC

2017 Jan

## Measure Maintenance

Annual Review

## Date of Next Anticipated Revision

Unspecified

## Measure Status

This is the current release of the measure.

This measure updates a previous version: AAAHC Institute for Quality Improvement. 2015 July-December colonoscopy study: procedure specific survey. Skokie (IL): AAAHC Institute for Quality Improvement; 2015. 2 p.

## Measure Availability

Source not available electronically.

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## Companion Documents

The following is available:

> AAAHC Institute for Quality Improvement. Colonoscopy January-June 2016 report: performance measurement and benchmarking in ambulatory care organizations. Skokie (IL): AAAHC Institute for Quality Improvement; 2016. 29 p.

For more information, contact the AAAHC Institute for Quality Improvement at 5250 Old Orchard Road, Suite 250, Skokie, IL 60077; Phone: 847-853-6079; Fax: 847-853-6118; E-mail: nkuznets@aaahc.org; Web site: www.aaahc.org/institute .

## NQMC Status

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# Production

## Source(s)

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